

REMARKS/ARGUMENTS

Favorable reconsideration by the Examiner is respectfully requested in light of the foregoing amendments and the remarks which follow.

In the outstanding Office Action the Examiner rejects Claims 1 to 3 and 6 to 10 as being anticipated by GRAVES (US 6 874 897 and claims 1, 4 and 5 as anticipated by MICHELET (US 4 298 247).

GRAVES discloses (see fig. 2) PZT plates 30 and 32 that are separated by layers 34, 38, 36. Layers 34 and 36 are made of gold (or of highly conductive material) and plates 30 and 32 are bonded together by an adhesive layer 38 between layers 34 and 36.

The deformable curvature mirror is operated by way of a voltage that is applied between gold layers 34, 36, 42 on the one hand and one or more of the wires W-1 through W-N (attached to terminals 44-1 to 44-N) on the other hand, to cause lateral expansion of the plate 30 (see col. 6, l. 1-25). Since gold layers 34, 36, 42 are at the same voltage (grounded), active front plate 32 and passive rear plate 30 mechanically behave in the same manner with respect to thermal expansion and contraction because the thermal expansion coefficient is controlled by grounding (see col. 6, l. 26-51).

In the passage that is cited by the Examiner, the thickness that is cited is relative to the PZT plates 30 and 32 and not to the layers between those plates. Rather the layers 34, 36 are of gold (or of a highly conductive material) which, for the person skilled in the art, suggests a thickness of about 0.2μ which is far away from the minimum value of 1 mm for the claimed semi-rigid beam.

In a bimorph mirror, the piezoelectric elements are active, and are mounted with opposite polarities, which produces a compression displacement for one of the layers and a traction displacement for the other (see last paragraph of the description). The mirror is curved since layers 1 and 2 are disposed on opposite sides of the neutral fiber.

The claimed core enables to increase on the one hand the effectiveness of each ceramic by moving it away from the neutral fiber of the mirror which is situated substantially in the mid-

plane of core 5, and on the other hand the inertia of the mirror as well as its stiffness and stability (see description [00173] to [0020] of the present application, published as US2007/279775).

To better distinguish over GRAVES, claims 1 and 9 have been amended to specify that the first and second layers of piezoelectric ceramic have opposed polarities. Thus, the claims can not be considered anticipated by the structure of GRAVES.

MICHELET discloses a thick optical element having a variable curvature and which is comprised of two bimorph structures which are assembled with each other by a layers 14 of elastic material having a low tensile strength, for example a silicone elastomer. Note that the silicone elastomer mentioned p. 2, l. 52 is recited by the Examiner as "silicon material", namely Si which is entirely different from the silicone elastomer which is an elastic material.

Each bimorph structure consists of two elements (2, 3; 11, 12) of piezoelectric ceramic material which are conventionally assembled by means of a layer (4, 13) of an adhesive material (col. 1, l. 61- col. 2, l. 7). The purpose of associating two conventional bimorph structures by means of layer 14 having a low tensile strength, e.g. an elastomer (col. 2, l. 4-11) is increasing both the mechanical stiffness of the optical element and its thickness (col. 3, l. 34-41). This document does not disclose nor suggest to modify the characteristic of a single bimorph structure.

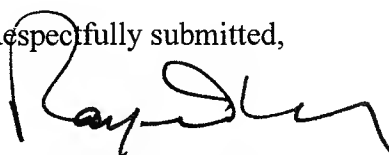
It also neither teaches nor suggests a core constituting a semi-rigid beam, because the layer 14 is made of an elastic material, namely an elastomer. Also, layer 14 is not situated between the piezoelectric elements to move them away from the neutral fiber of the two piezoelectric layers of the bimorph structure. Rather, layers 1 and 2 on the one hand, and 11 and 12 on the other hand are assembled by conventional adhesive layers, respectively 4 and 13.

We thus submit that independent claims 1 and 9 are both novel and non-obvious with respect to the cited prior art. Claims 2 to 8 and 10 are also patentable since they specify additional features which are not taught by the cited prior art and they also distinguish over the prior art for the reasons given above for claims 1 and 9. Accordingly, withdrawal of the rejections and formal notification of the allowability of claims 1 to 10 as now presented are solicited.

Appl. No.: 10/597,697
Amdt. dated January 13, 2009
Reply to Office Action of September 17, 2008

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefor (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,



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LEGAL02/31106788v1